Health Consultation

Whitfield County

Conasauga River
October 7, 2010

Introduction
The Georgia Division of Public Health (GDPH) has reviewed available fish data from a section of the Conasauga River located east and southeast of Dalton, Georgia. GDPH notified the Environmental Protection Agency (EPA) to inform them of their findings regarding the potential for adverse health effects from exposure to perfluorooctane sulfonate (PFOS) found in fish and fresh water mussels caught in the Conasauga River near Dalton.

Surface water sampling for polyfluorochemicals (PFCs) in the Conasauga River was conducted by the University of Georgia (UGA) in 2006. Results showed that concentrations of perfluorooctanoic acid (PFOA) and PFOS were higher downstream than upstream of the Loopers Bend Wastewater Treatment Plant, and wastewater Land Application System (LAS) site where treated wastewater is sprayed on over 9,200 acres of wooded peninsula surrounded on three sides by the Conasauga River. These sites are located approximately 4.5 miles southeast of Dalton. The 2006 study found that PFOA concentrations ranged from 253-1,150 nanograms per liter (ng/L); while the PFOS concentrations ranged from 192-318 ng/L. In the summer of 2009, UGA conducted a study to measure PFOS levels in fish and mussels caught in the Conasauga River near Dalton. Sampling locations included a site upstream of the Loopers Bend Wastewater Treatment Facility, at a site adjacent to the wastewater treatment site, and two sites downstream of the wastewater treatment site.

Site Description and History
PFOA and PFOS are two compounds from a broad class of manufactured chemicals known as PFCs that have been produced since the 1950s. This class of chemicals is used into make products that resist oil, stains, heat, water, and grease. These products include non-stick cookware, oil and moisture-resistant paper coatings, stain-resistant carpets and fabrics, nail polishes, and fire-fighting foam. Apart from many consumer-product uses, the aerospace, automotive, construction, chemical-processing, electrical and electronics, semiconductor, and textile industries use them as well.

Two chemicals in this class, PFOS and PFOA, have been a concern because they persist in the environment. Both PFOS and PFOA accumulate in wildlife such as bald eagles, mink, bears, sea mammals, and fish, and PFCs have been found in people. The chemical process that uses perfluorooctanesulfonyl fluoride and results in the formation of PFOS and several other PFCs was discontinued by 2002 in the United States. However, PFOS can also from the degradation of precursors in addition to industrial production. PFOA is currently used as a processing aid when making fluoropolymers.

In 2007, the Centers for Disease Control and Prevention (CDC) published results of two studies of human exposure to 12 PFCs. In the first study, CDC measured levels of PFCs in the serum of 1,562 people 12 years old and older who took part in CDC's National Hea1th and Nutritional Examination Survey (NHANES) during 1999 and 2000. In the second study, CDC measured levels of PFCs in the serum of 2,094 people 12 years old and older who took part in NHANES during 2003 and 2004. In both studies, PFOS and PFOA were detected in approximately 98% of the population. These findings confirm widespread PFC exposure in the U.S. population.

PFOA and PFOS are used by some companies in the Dalton carpet industry, which produces 80 percent of the nation's carpets, to make stain-repellent floor coverings. Concerns in Dalton prompted the Georgia Environmental Protection Division (GEPD) to begin statewide sampling at drinking water intakes for PFOA in 2008. In January 2009, the United States Environmental Protection Agency (USEPA) issued Provisional Health Advisory values for PFOA and PFOS. The provisional health advisory concentrations are 400 ng/L (or parts per trillion) for PFOA and 200 ng/L for PFOS in drinking water. In March 2009, USEPA, Region 4, along with GEPD, conducted a public water sampling investigation in North Georgia. Public drinking water from plants in Dalton, Calhoun, Rome and Floyd County were sampled to obtain levels of perfluorinated compounds in the drinking water. The laboratory results identified both PFOA and PFOS in samples from 2 of 15 stations. Both samples contained PFOA and PFOS at levels less than

the provisional health advisory concentrations.

Environmental Sampling
In the summer of 2009, UGA collected three Spotted Bass and three Blue Catfish from four locations on the Conasauga River east and southeast of Dalton. Background samples were obtained upstream of the Loopers Bend Wastewater Treatment Plant, approximately four miles east of Dalton, near the Hwy. 76 Bridge. Another sample location on the Conasauga River was directly south of/and adjacent to the Loopers Bend Wastewater Treatment Plant and LAS site, approximately 4.5 miles southeast of Dalton. The third sample location was approximately 6.5 southeast of Dalton near the Tilton Bridge. The fourth sample location was near the Hwy. 225 Bridge in Resaca, Georgia, approximately 11 miles southeast of Dalton. Three Freshwater Mussels were also caught at three of these four locations; none were found at the Tilton Bridge location. Several additional species of fish were captured and archived from each site so that they could be analyzed at a later dale. Both the liver and fillet of the fish caught in the river were analyzed for PFOS; however, only the fillet sample results are reviewed for exposure analysis.

Results
When using the No Observable Adverse Health Effects Level (NOAEL) established in the Seacat et. a1. study, we find the estimated exposure doses that recreational freshwater anglers would receive from consuming fish caught in the Conasauga River to be approximately 300 to 600 times lower than the NOAEL. Estimated exposure doses from consuming freshwater mussels would be approximately 30,000 to 37,500 times lower than the NOAEL. The estimated exposure doses to subsistence freshwater anglers would be approximately 75 to 750 times lower than the NOAEL, while the estimated exposure doses from consuming freshwater mussels would be approximately 3,000 to 6,000 times lower than the NOAEL. Therefore, GDPH concludes that consumption of fish and freshwater mussels caught in the Conasauga River southeast of Dalton by recreational and subsistence freshwater anglers poses no risk to adverse health effects from this consumption.

Conclusions
Because of the persistent, stable nature of PFOS and PFOA, as well as their presence in the environment over the last 50 to 60 years, exposure to these chemicals is now ubiquitous. The exposure dose contribution from fish and freshwater mussels found in the Conasauga River near Dalton to recreational and subsistence freshwater anglers; however, is not expected to harm people's health because the estimated exposure doses are many times lower than exposure doses shown to have adverse health effects in many animal studies.

Recommendations
- Recreational freshwater anglers should follow the 'Guidelines for Eating Fish from Georgia Waters' published by the Georgia Department of Natural Resources (DNR).
- The 'Guidelines' for the Conasauga River (Coosa River Basin) make a recommendation of no more than 1 meal/week for Spotted Bass and depending on the size of Blue Catfish, no more than 1 meal/week or 1 meal/month. Mercury and PCBs are the chemicals of concern measured on the Conasauga River.